School Shop

vol. VII no. 6
FEBRUARY, 1948

Yesterday, Today, and Tomorrow in Vocational Education
by C. M. Miller

Light Scope for Cutting Stencils
by Tatro and Christensen

Make This Plastic Tray
by Andrew Kovach

A Student Rating Scale
by Clifford K. Lush

On the cover: Student doing forge work at Tucson, Ariz., High School. Photo by Munn Wong, student in Graphic Arts Department, H. A. Goldstein, instructor.

THE MAGAZINE FOR TEACHERS OF INDUSTRIAL EDUCATION

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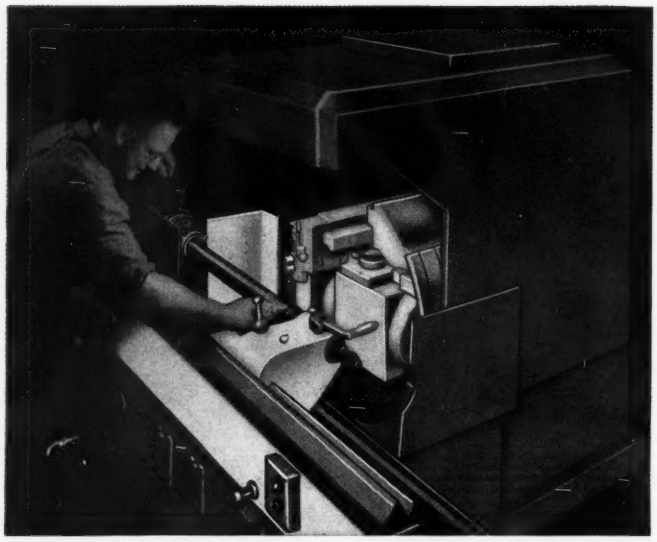

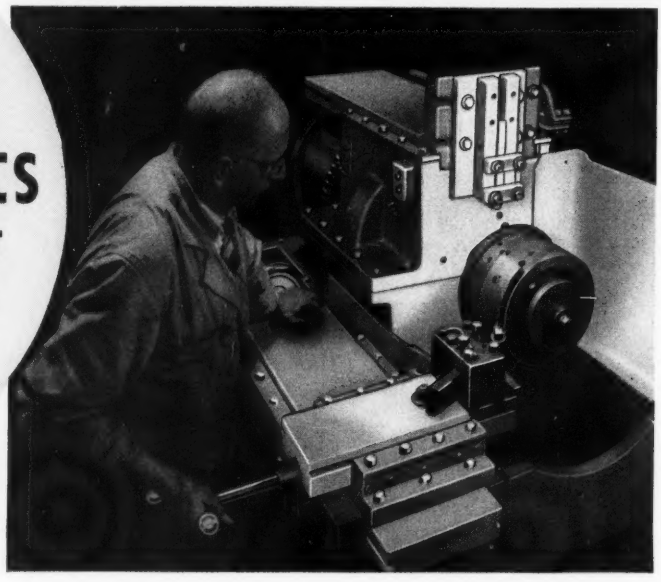

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In the Offing....

Soon SCHOOL SHOP will bring you a report by R. W. Gregory, Assistant Commissioner for Vocational Education, U.S. Office of Education, on the results achieved under the George-Barden Act. Watch for the special April Directory Issue of SCHOOL SHOP with its handy listing of suppliers to the field.

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School Shop

FOR INDUSTRIAL EDUCATION TEACHERS

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School Shop is published monthly, September through June, at Ann Arbor, Michigan. Manuscripts are paid for at regular space rates and should be addressed to the Editor, School Shop, 330 South State Street, Ann Arbor, Michigan. Subscription rates, $2.00 a year; Canadian, $2.00 a year; foreign $3.00 a year. 25 cents a copy. Printed in the U.S.A.

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Advertising Representatives: Mid-West—Macintyre-Simpson & Woods, 75 East Wacker Drive, Chicago 1, Central 1715. Eastern—Macintyre, Simpson & Woods, 101 Park Avenue, New York 17, Lexington 2-8998. California: Duane Wanamaker, Suite 623, 610 South Broadway, Los Angeles 15, California, Mutual 2161.

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School Shop TALK

COMMENTS ON ISSUES FACING INDUSTRIAL EDUCATION

The Tune Changes

Apparently the public, or at least a segment of it, is beginning to question just how good the public schools are. For some time, the emphasis in lay magazine and newspaper articles has been on the plight of the teacher and the schools.

In recent months a more critical note has crept into articles in general periodicals. Writers are asking how well the schools are preparing youngsters for presentday living.

This switch in emphasis has been tabulated by the Educational Research Service of the NEA.

Shop subjects so far have been spared the critical whip. Most of the blasts are at schools generally and not at specific subjects. This does not mean, however, that industrial education should sit tight.

Good public relations means that the public has a knowledge of what industrial-education departments in schools are doing and what kinds of success they are achieving.

Most industrial-education departments are woefully weak in this respect. Not only is the public uninformed of what is going on, but oftentimes the rest of the school staff has no real understanding of the objectives and achievements of the industrial-education program.

A few state departments have issued bulletins such as *Vocational Education in Action* from California and *For the Greatest Good* from Michigan which help to interpret the program. Most impressive of these, from a factual standpoint, was the New York State publication issued under the direction of S. Lewis Land which showed in black and white what had been accomplished under the VTWPW program. No one would question the expenditures for this program after seeing the facts as they were presented in an attractive manner in this bulletin.

The major public-relations job rests with the local industrial-education department, however. Pamphlets, talks, demonstrations, radio programs, open houses, newspaper stories, community-service projects, parent programs, to mention a few activities, help to inform the public. One splurge once in awhile is not enough. "Keeping everlastingly at it" is the motto of one of the great advertising agencies. The chances are a hundred-to-one that the man in the street doesn't know what your department is doing, yet you are working for him and he is paying the bill. He deserves to know.

An expert public-relations man is not needed to interpret a program. The director or teacher with imagination can do wonders.

Schools are always good targets for critics. By and large such a situation is healthy in a democracy. But criticism based on inadequate information is dangerous and can be disastrous.

If you are doing a good job, let the public in on it. Such action won't eliminate the howls, but it will tone them down and the part of the public that is informed will come to your defense. Moreover, you'll get support when you need it to better your program.

Your Editor

Abraham Lincoln on Education

"The thought occurs that education—cultivated thought—can best be combined with . . . any labor, on the principle of *thorough* work—that careless, half performed, slovenly work, makes no place for such combination. . . .

"It is said an Eastern monarch once charged his wise men to invent him a sentiment to be ever in view, and which should be true and appropriate in all times and situations. They presented him the words, '*And this, too, shall pass away.*' How much it expresses! How chastening in this hour of pride; how consoling in the depths of affliction! 'And this, too, shall pass away.' And yet, let us hope, it is not *quite* true. Let us hope, rather, that by the best cultivation of the physical world, beneath and around us, and the intellectual and morals worlds within us, we shall secure an individual, social, and political prosperity and happiness, whose course shall be onward and upward, and which, while the earth endures, shall not pass away."—*Address before the Wisconsin State Agricultural Society at Milwaukee, September 30, 1859.*

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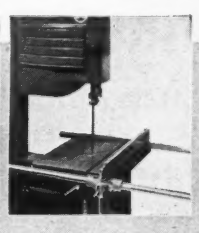

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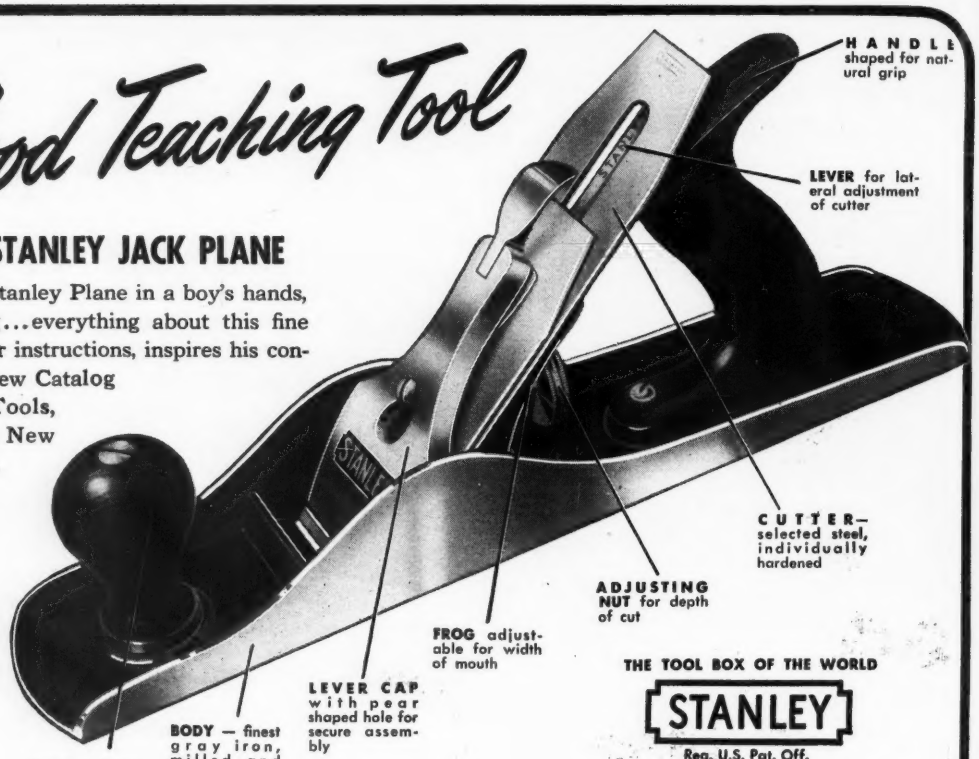
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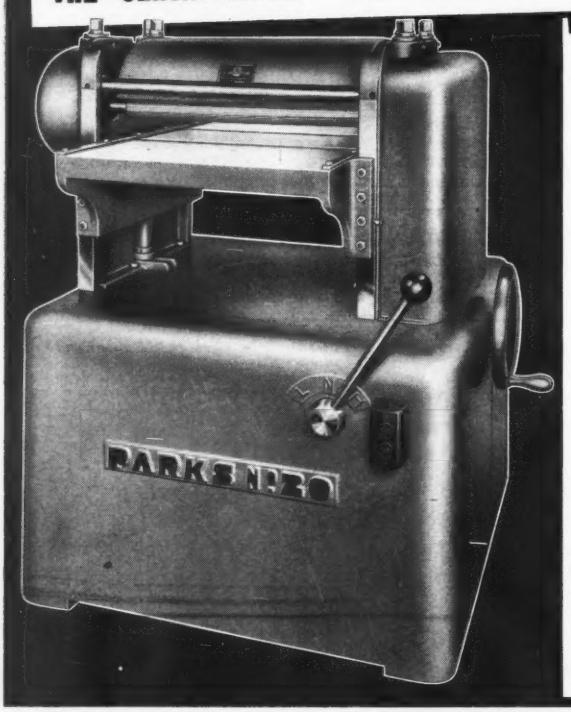

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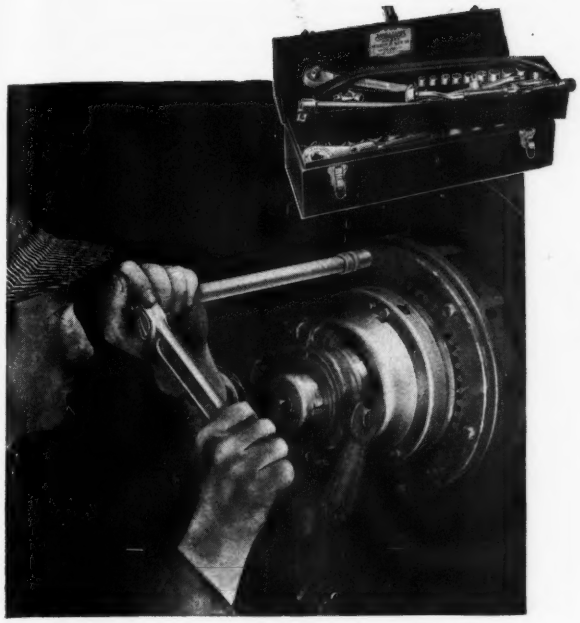

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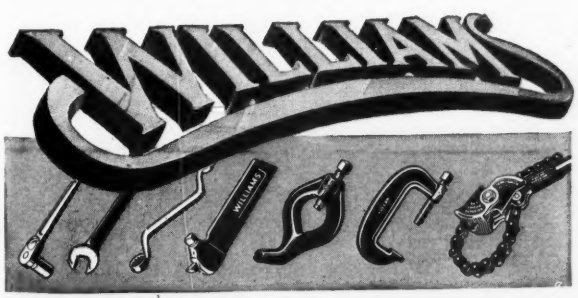

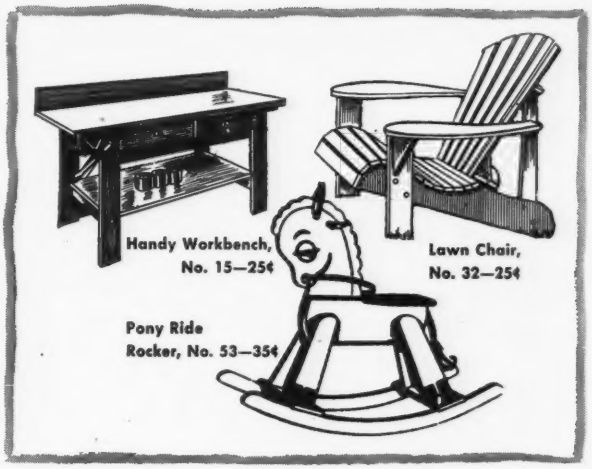

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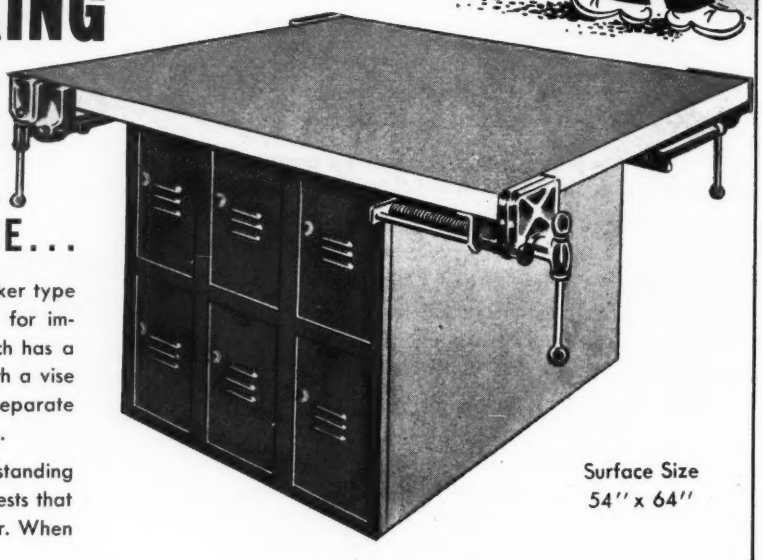

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Yesterday, Today, and Tomorrow in Vocational Education

BY *C. M. Miller*
Director, Kansas State Board for Vocational Education

EDITOR'S NOTE: This is an abridgement of a speech delivered on December 16, 1947, at the Los Angeles Convention of the American Vocational Association. The issues raised by Mr. Miller are of such great importance that SCHOOL SHOP considers it a duty to bring them to the attention of its readers. For a further report on these issues, readers are referred to our Washington news letter on page 32 of this number. The columns of SCHOOL SHOP are open to factual discussions of all sides of this and other issues which face the profession.

IN thumbing through the pages of the history of vocational education, we come to the enactment of the Smith-Hughes Law. It provided for a Federal Board for Vocational Education consisting of the Secretary of Agriculture, the Secretary of Labor, the Secretary of Commerce, the Commissioner of Education, and three citizens appointed by the President and representing labor, agriculture, and industry.

The machinery set up for the administration of vocational education under the Board consisted of a director who was assisted by a chief of each of the services of agriculture, homemaking, and trade and industrial education. They, in turn, were assisted by four regional agents in each of the services.

Under this administrative arrangement, but without chart or compass, a program of vocational education was developed around the regional agent and in cooperation with the states that served this country exceedingly well, within the limits of funds, in both peace and war; in depression and prosperity.

Cooperation with the states is the keynote of the Smith-Hughes Act. It seeks to avoid federal domination and the Board used every means and device within its power to make it truly a cooperative effort.

The Function of the Regional Agent

The regional agent was the contact person between the state program and the federal government. He knew the strength and weakness of the program in every state in his region. There were times, of course, when we in the states did not see eye to eye with the regional agent on every problem, but the result of our discussions was a composite judgment which was better because of original lack of agreement.

A natural development was the regional conference. These served a highly useful purpose, for by means of the discussions which were the natural result of a dozen states meeting in conference, the development of the best in standards and practices and the elimination of the less useful were accelerated.

But a regional conference, the agenda for which do not stem from the problems of the region as recognized by the regional agent and the states within the region, is only half a conference, or even less. It works from the outside in, which is the wrong direction.

New Auditing System Expensive

The regional agent audited the accounts of the state board and having intimate knowledge of every program within the state made it possible for him to audit not loosely, but strictly and constructively within the spirit of the law. A law so flexible as a vocational education law, must be interpreted understandingly and flexibly if it is to cover the great variety of situations intended.

Audits by unsympathetic auditors can result in federal control and domination of the most damaging kind. Under the proposed auditing division it will cost 35 to 50 thousand dollars annually to do much less well what has been accomplished every year for 30 years by regional agents.

Vocational Education Has Had to Fight

But there came a new day, and the functions of the Federal Board for Vocational Education were transferred to the Office of Education in 1933, and the Commissioner of Education became, in effect, the Federal Board. From that time forward, vocational education has had a new and increasingly difficult fight for its existence. Efforts have constantly been made to integrate vocational education into the total program so completely that it would lose both its identity and its usefulness.

Everyone in vocational education who has found his stride knows that no one is at his best in any area or on any level of education until he has developed for himself a philosophy of education which includes everything that happens to boys and girls from kindergarten through college. We in vocational education want no less of effort spent in other areas of education. We recognize the urgent need for better educational opportunity in all areas and on all levels. We do not pretend to serve all educational needs. We do not understand, however, why educators in other areas should oppose or seek to hinder the further development of the admittedly important area of vocational education.

What we want, and indeed must have, is that vocational education be treated as one of the special areas and that it be kept vocational. To attempt to train for the skilled trades in a setup that does not meet the approval of the best tradesmen in a given trade is folly and suicide.

Standards Must Be Maintained

Standards in vocational education which have been developed through the years, largely by the trial-and-error method, must and shall be maintained. We cannot compromise in that particular, for to do so is to betray those whom we would serve. Since the transfer of the functions of the Federal Board for Vocational Education to the Commissioner of Education, there have been constant attempts from every angle to change practices, policies, and standards, thereby frustrating and breaking down the entire program of vocational education.

Vocations change, and we are often called on to train for new vocations. Specific training within a vocation may change. Methods of instruction may be improved. But there are certain fundamental philosophies that we dare not vacate. There are certain standards from which we must not recede. There are certain principles we cannot compromise. Among them is the well established principle of requiring that vocational teachers be occupationally competent and that they be supervised by occupationally competent people. Another is that the training situation approximate as accurately as possible actual wage-earning job conditions. Still another is that learners be segregated with respect to the vocation for which training is to be accomplished.

Specialists Necessary

It is no secret that the Commissioner has lost no opportunity to foment chief state school officers and other school administrators against the plan of having vocational education administered and supervised by specialists. It is no secret that in certain states where the Commissioner has greatest influence the pattern for state supervision follows very closely the plan his office has developed.

If the plan for administration, direction, and supervision by others than specialists prevails, we may as well admit that vocational education has reached its zenith and the road from here on is down hill.

It is no secret that no increase in appropriations under the George-Barden Act would have been made except for the fine work you state people did in cooperation with your American Vocational Association in bringing to the attention of the Congress the very urgent need for additional funds. And as a direct result of that effort, there is reason to hope we may even get the full amount authorized in the George-Barden Act in our next appropriation.

It is a matter of common knowledge that more money was appropriated by the Eightieth Congress for the administration of vocational education than was ever appropriated before. It is no secret that part of that appropriation is being used for purposes that yield no dividends to the administration of vocational education.

New Plan Demoralized Vocational Education

When the appointment of Doctor Gregory to succeed Doctor Wright was announced at our Buffalo Convention in February, 1946, it met with rather general approval. But what we did not know was that a plan was already in the making which would almost completely demoralize the administration of vocational education and impair the fine relationships between the Office of Education and the states in the administration of vocational education.

We recognize the fact that the Office of Education has a great responsibility in administering so important a program as that of vocational education. We recognize the legal right of Doctor Studebaker and his staff to hand to the states any plan they choose, within the law, for the administration of vocational education. But, inasmuch as the program functions in the states and through the cooperation of the states, we believe it would have resulted in much better relations if the states had been at least informed that a change was in the making. We do not understand why, if the plan were considered legitimate, it could not have been discussed with the states before it was put into effect.

We do not resent change simply because it is change, nor do we resist change if we can be convinced that change makes for improvement. We do not even resent not being consulted in the development of the new plan. What we do resent is that we were called together in group conferences and handed an entirely new plan, effective as of that date, August 1, 1946, which we did not like at the time, and which has resulted in less than a year and a half in almost completely demoralizing the staff of the Office of Education and destroying the fine relations that had existed for so long between the states and the Office of Education.

Difficult to Get Professional Service

Never in my experience have I seen the morale of the Vocational Division of the Office of Education so low. Never in my experience has it been so difficult to get professional service from the Office of Education.

We in the North Central States get an occasional visit from a man designated as field representative. He is a fine man. He had been our regional agent in agriculture for many years. He knows agriculture and has rendered valuable professional service in that area. He does now and we like to have him come. But he has been forced to pretend to give the same service in the other areas of trade and industrial education, homemaking education, business education, and guidance as well as teacher training in all services. Just as any other man would be, he is helpless and useless to us except in his special field of agricultural education.

Never in my experience has this country paid so much for so little in the administration of vocational education.

It is a matter of record that the new arrangement costs from three to four times as much for administration as the old plan. Under the old plan we got results. Under the new plan we get only confusion and chaos. Never in my experience have the members of the staff of the U. S. Office been so silenced as now. They are not free to express their views on any matter of administration policy. Even the chiefs of the services are not allowed to communicate directly with state directors or supervisors concerning any administrative matter. They prepare such official correspondence for the signature of the Assistant Commissioner—a policy uselessly slow and cumbersome and inadequate.

Among other objectionable features, the new plan sets up an elaborate program planning committee. We in the states believe the program should be planned in the states, and by the states, and for the states, as has been done so effectively for 29 years previous to August 1, 1946, with such professional assistance as they need from the Office of Education.

The new plan eliminates the regional agent. To us, the regional agent has been the key person. He has been the person who gave the professional help we needed. It eliminates the Regional Conference as it has been developed through the years, and a pitifully inadequate substitute has been forced on the states.

Federal Control and Minimum of Service

The new plan provides for almost complete federal control and a minimum of professional service. What we need is a minimum of federal control and a maximum of professional assistance.

For more than a year, as chairman of your joint committee of the National Association of State Directors of Vocational Education and the American Vocational Association, I've gone all out in my efforts to discover what motivated this revolutionary change in administrative setup. With your support, I've been trying to get it modified.

After we had sort of regained consciousness after the atomic pronouncement of August 1, 1946, we began to protest against the new order which was so unsatisfactory to the states.

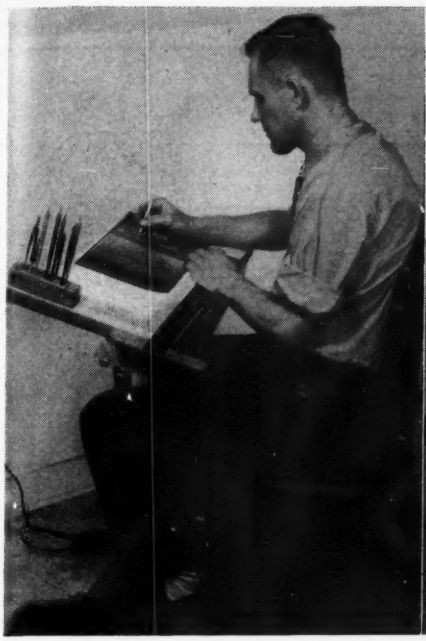
We had several conferences with Doctor Gregory. We wanted a modification of the new plan. We wanted one that would work. We wanted one in which we could work.

Doctor Gregory was not unfriendly but uncompromising. He had sought no counsel. He wanted none. He would countenance no interference. It was his plan and he would see it through, regardless of what the states wanted.

When we realized complete failure to get any consideration from Doctor Gregory, we sought conference, through our Executive Secretary, Doctor Dennis, with Doctor Studebaker, but were brushed off.

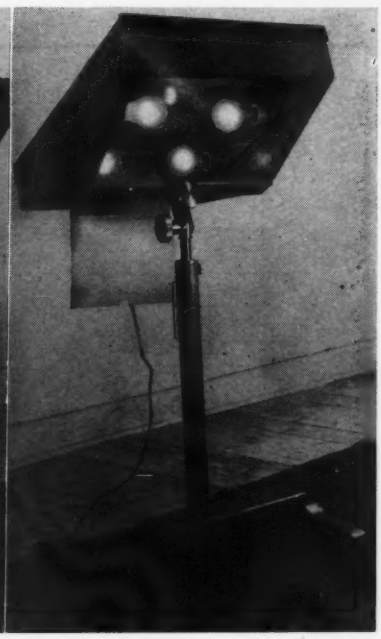
We were so deeply concerned about the future of vocational education that, failing in our attempt to get a conference with Doctor Studebaker, we sought a conference with the Honorable Mr. Ewing, Director of the Federal Security Agency. We were granted a conference on September 11, 1947. Mr. Ewing re-

(*Continued on page* 14)



The light scope in use.

Full view showing stencil in place and ground glass inset in the top.



The underside is not closed in so that heat from the light bulbs may readily escape

Light Scope for Cutting Stencils

BY *Earl E. Tatro*
AND *M. R. Christensen*

This project is made to order for shop teachers who want a project that will give students a feeling of contributing to the assets of the shop. The authors are teachers in the Bronx Vocational High School, New York City.

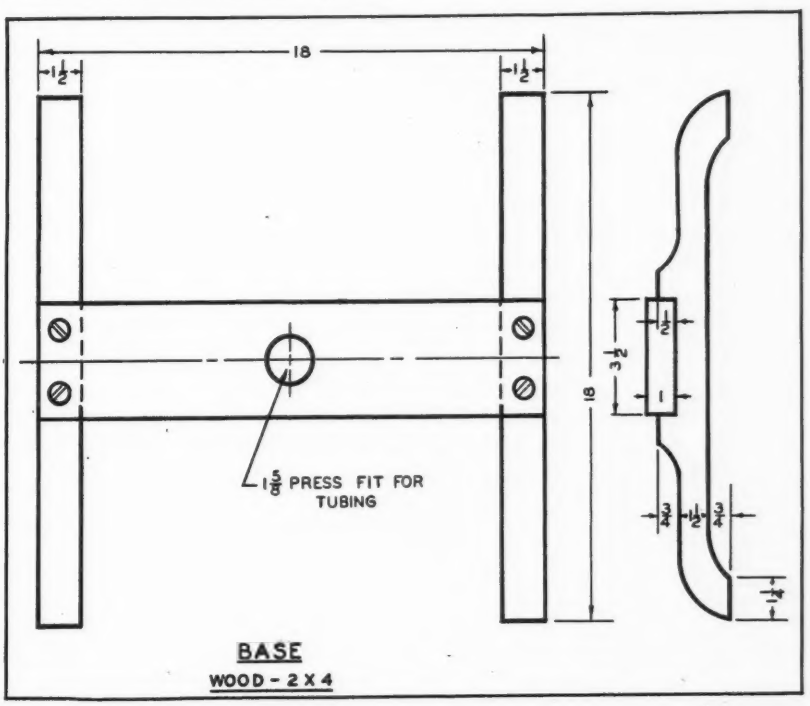
THE mimeograph process is an excellent means of reproducing teaching materials so necessary to the teaching of shop subjects. Reference is made to such items as job sheets, information sheets, assignments sheets, shop record forms, etc.

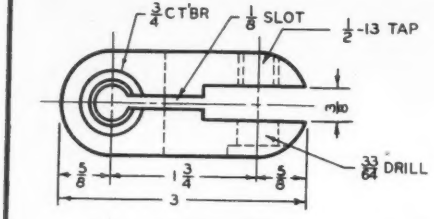
With the proper equipment and know-how, the cutting of stencils need not be the difficult task that many shop teachers believe it to be.

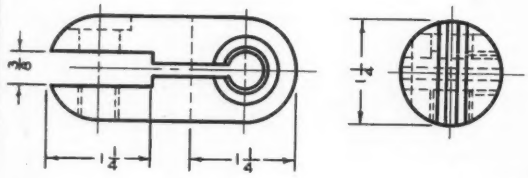
After using mimeographed shop materials for a number of years we can safely say that it has advantages over blue prints, at least as far as job sheets are concerned. It is a cheaper method; each student can be provided with a sheet or set of sheets; the problem of collecting job sheets is eliminated, as each student keeps the sheets in a loose-leaf notebook; copies are quickly and easily run off as needed; and the stencils can be used many times if properly cared for after using.

The first important item of equipment is the light scope shown here. Instructors will find it a source of pleasure to cut stencils with this piece of equipment. It has many advantages over commercial models and is simple and inexpensive to make. It can be swivelled to any position, tilted to any angle, and adjusted vertically for proper height. These features are of utmost importance when making drawings on stencils.

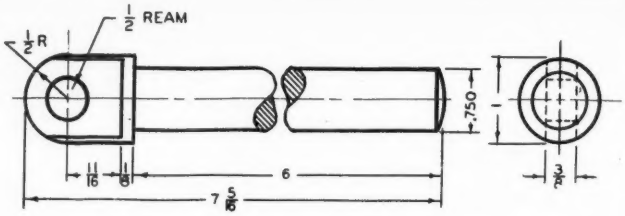
Most of the materials needed in making the light scope are readily available in most school shops, or may be purchased for a small amount. Substitutions from the specified materials may be made without lessening the value of the item. For example, if aluminum tubing is not available, use bar steel of a



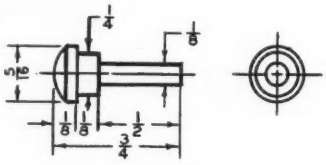




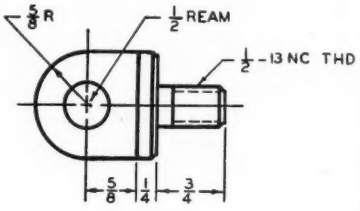
SWIVEL JOINT
C.D.S. - 1 REQUIRED

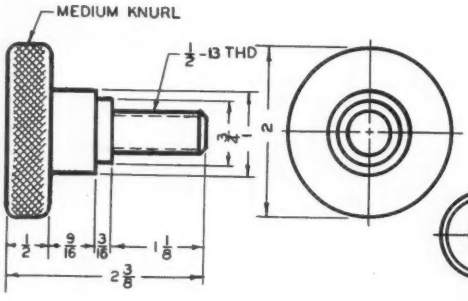


HEIGHT ADJUSTING SPINDLE
C.D.S. - 1 REQUIRED

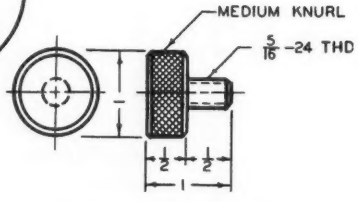


STENCIL PIN
C.D.S. - 4 REQUIRED

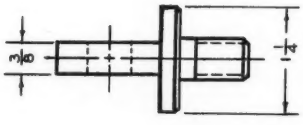




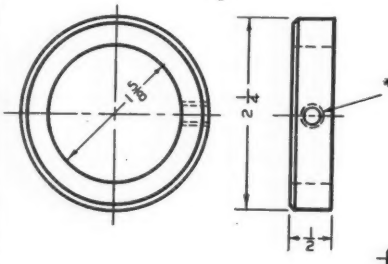
CLAMPING KNOB
ALUMINUM - 2 REQ'D.



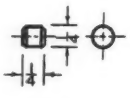
HEIGHT ADJUSTMENT
CLAMP SCREW
C.D.S. - 1 REQUIRED



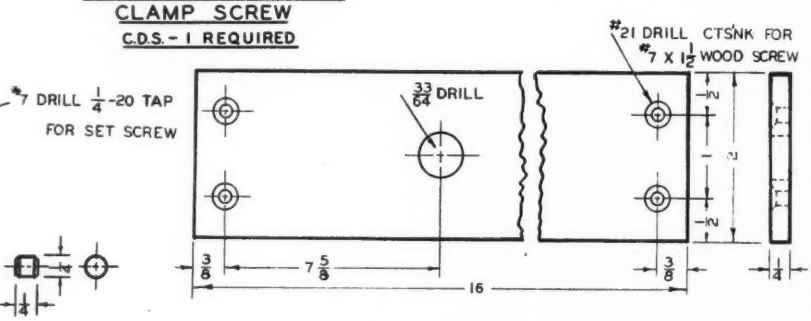
UPPER SWIVEL BOLT
C.D.S. - 1 REQUIRED



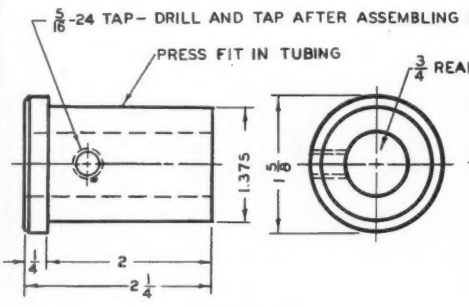
COLLAR
C.D.S. - 1 REQ'D.



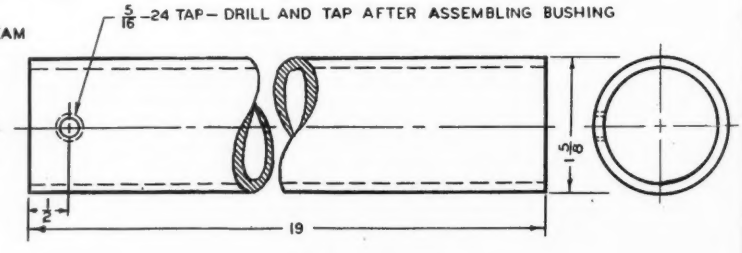
PLUG
BRASS - 1 REQ'D.



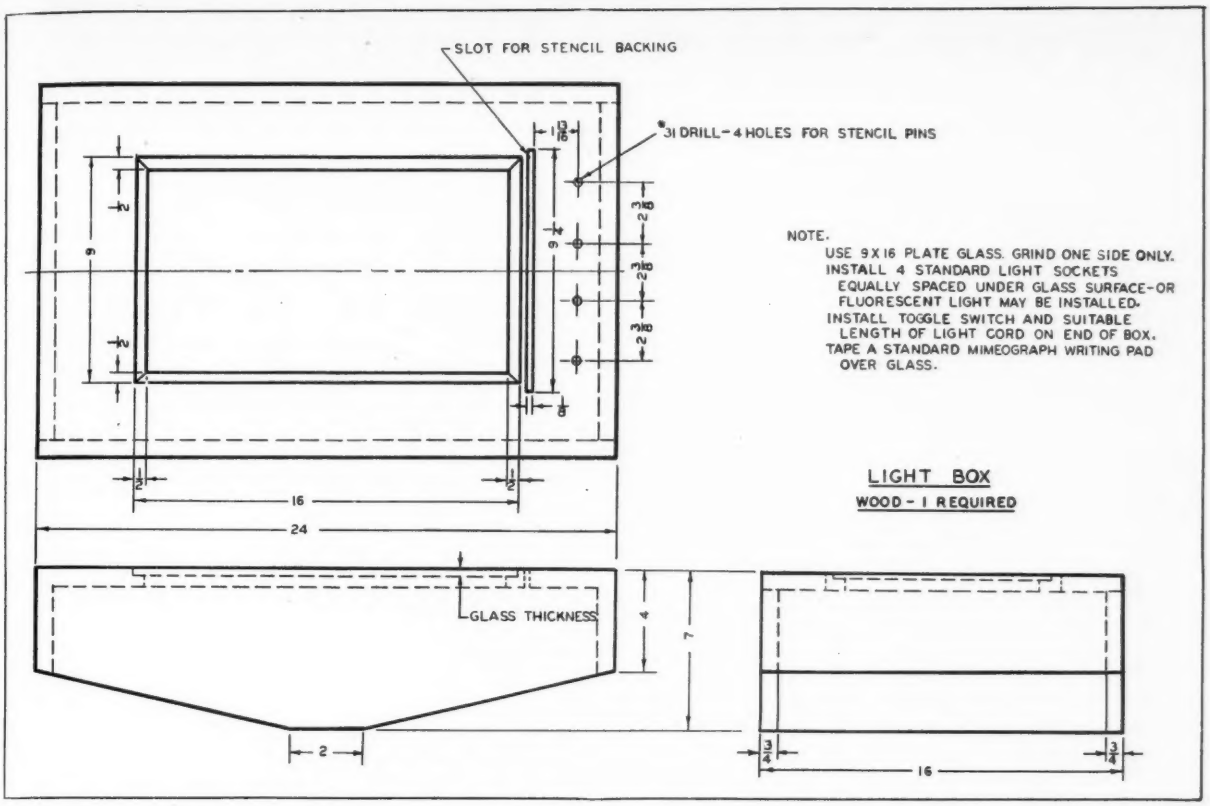
CROSS BAR
C.R.S. - 1 REQ'D.



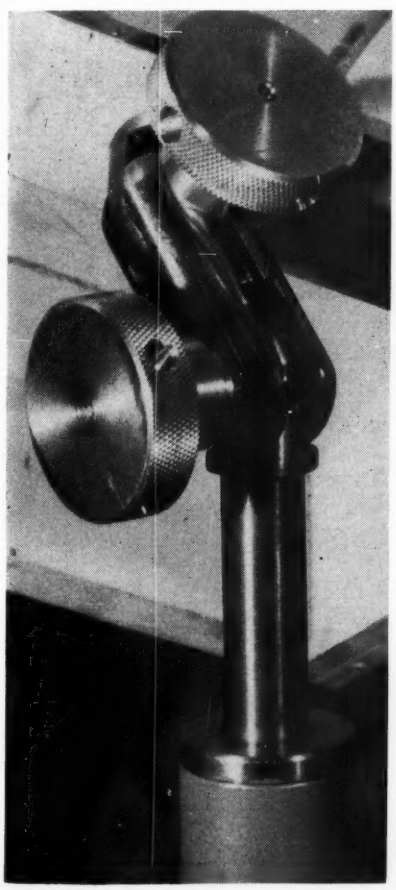
TUBE BUSHING
C.D.S. - 1 REQ'D.



STAND TUBING
ALUMINUM - 1 REQ'D.


SLOT FOR STENCIL BACKING
*31 DRILL-4 HOLES FOR STENCIL PINS
NOTE.
USE 9X16 PLATE GLASS. GRIND ONE SIDE ONLY.
INSTALL 4 STANDARD LIGHT SOCKETS EQUALLY SPACED UNDER GLASS SURFACE-OR FLUORESCENT LIGHT MAY BE INSTALLED.
INSTALL TOGGLE SWITCH AND SUITABLE LENGTH OF LIGHT CORD ON END OF BOX.
TAPE A STANDARD MIMEOGRAPH WRITING PAD OVER GLASS.
LIGHT BOX
WOOD - 1 REQUIRED
GLASS THICKNESS
16
24

Close-up view of swivel joint and height-adjusting spindle.



smaller size and drill the hole in the base to suit.

The ground glass in the box is easily made by cutting an old auto windshield to proper size and grinding on one side with emery and a cast-iron lapping plate. To grind the glass quickly and easily place a newspaper under the glass on a work bench, wet the glass surface with kerosene, sprinkle on a small quantity of emery or carborundum powder, and rub with a cast-iron lapping plate, using irregular motions until the entire surface of the glass has been ground. Wash with soap and water and dry.

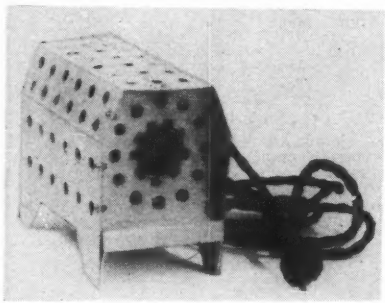
The detail drawings give all necessary information for making the various parts. Four 25-watt lamps in the box provide adequate light, or fluorescent lamps may be used.

Schools equipped with wood, metal, and electric shops could work this as a group project, each shop doing the necessary work on a number of the light scopes. The operations are practical and provide excellent training jobs for students.

Good results in cutting stencils have been obtained by taping a standard mimeograph writing pad, obtainable in most stationery stores, over the ground glass. The drawing or blueprint to be traced is placed between the glass and the writing pad so that the actual cutting of the stencil is done directly on the writing pad. A sheet of cellophane placed over the stencil also aids in cutting clear, sharp lines without damaging the stencil, especially when knurled or threaded parts are to be drawn.

RECENTLY appointed directors of the new State Institutes of Applied Arts and Sciences in New York state are: C. C. TYRRELL, Binghamton; RICHARD R. DRY, Buffalo; OTTO KLITGORD, New York City; and PAUL B. RICHARDSON, Utica. . . . W. T. REED, formerly principal of the Sussex County Training School, Waverly, is director of trade and industrial education, St. Paul's Polytechnic Institute, Lawrenceville, Va. . . . JOHN M. HURLEY has been reelected president of the Associated Guilds of Teachers of Industrial Arts of New York City for 1948. . . . GLENN E. SMITH has been named chief of the guidance services division, Office of Vocational Education for Michigan. . . . ARTHUR A. MARTIN has been appointed head of the department of industrial arts, Gorham, Me., State Teachers College.

Electric Soldering Copper Heater



BY *E. A. Rerucha*

A number of workshop experiences are provided for students in the construction of this project, such as reading drawings, selecting materials, laying out, cutting, filing, drilling, forming, and assembling. E. A. Rerucha teaches at the Leyden Community High School, Franklin Park, Ill.

TESTED PROJECT

THE electric soldering copper heater here described will accommodate coppers up to 1⅜" in diameter and will heat them hot enough to solder in a relatively short time. As many as four small coppers may be heated at the same time. The heater adapts itself very well to school shop use. It is considerably less in cost than even a cheap electric iron. The cost of construction is about one dollar and the general performance superior to that of a small, cheap electric iron in that it will accommodate and heat satisfactorily coppers of various sizes as stated above.

The heater may also serve as a shop stove for which various uses will be found, particularly in the electric shop, such as melting and keeping hot sealing and insulating compound, melting wax and paraffin, etc.

Construction of the project provides several workshop experiences such as reading of drawings, selection of materials, laying out, cutting, filing, drilling, forming, and assembling.

No. 19- or 20-gage sheet iron (U.S. Standard) may be used for the parts.

The completed heater is shown in the picture and in the assembly drawing (Fig. 1). First lay out each part as shown in the various detail drawings and cut to shape and drill the necessary holes. File all rough edges smooth. Bend to shape as shown in the drawing.

As the dimensions and shape of the cone-type heater element or the receptacle may vary somewhat, the length of the tube shown in Fig. 6 will have to be determined in assembly. Attach the receptacle end part (Fig. 2) to the case. Screw receptacle in position. The receptacle has a porcelain neck which fits through the 1½" diameter hole. Screw the porcelain ring over the neck from the inside of the case. Screw element into receptacle. Prepare the tube by making cuts in the end which enters the cone of the element and bend the fingers thus formed inward so that they fit tightly against the inside of the element

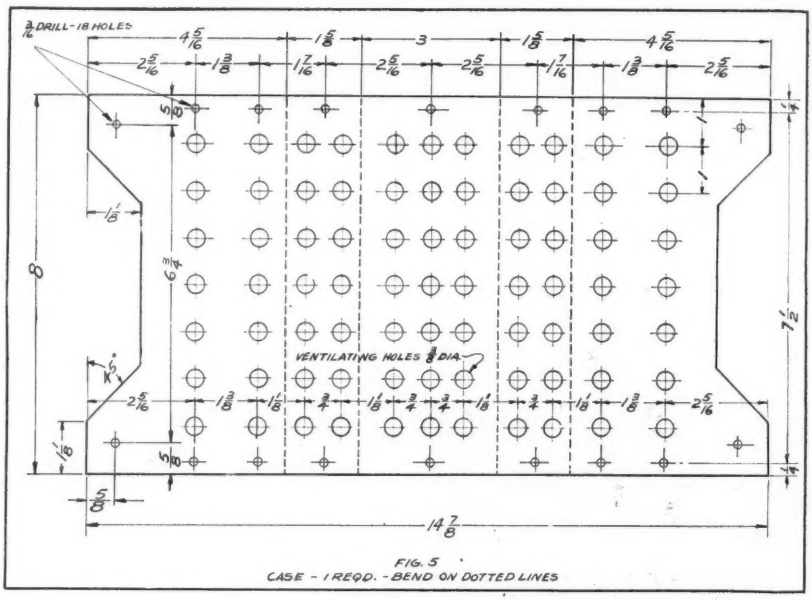


FIG. 5
CASE - 1 REQD. - BEND ON DOTTED LINES

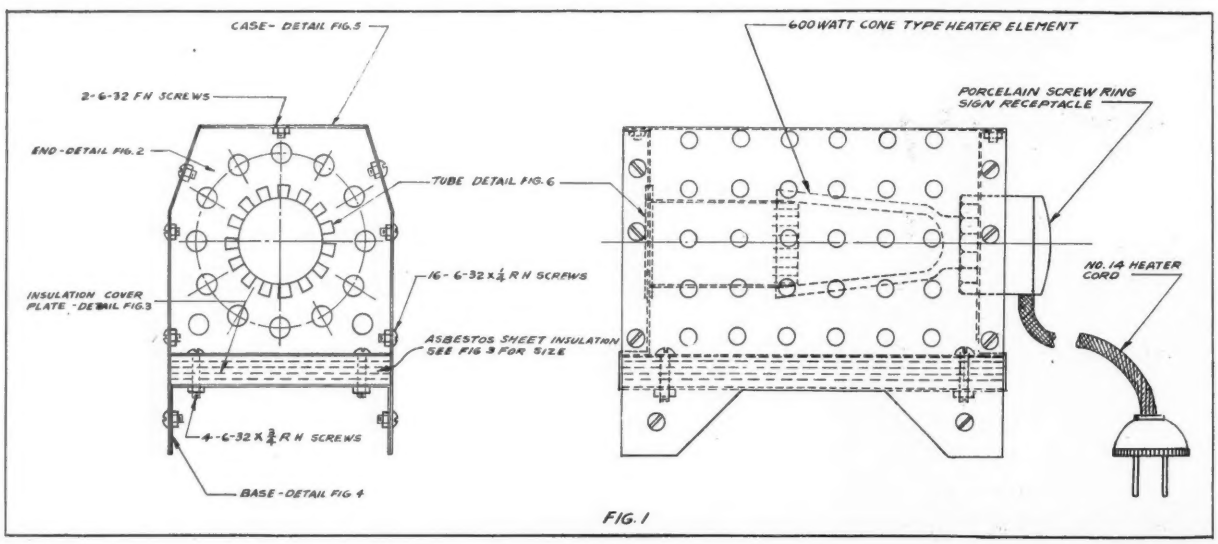
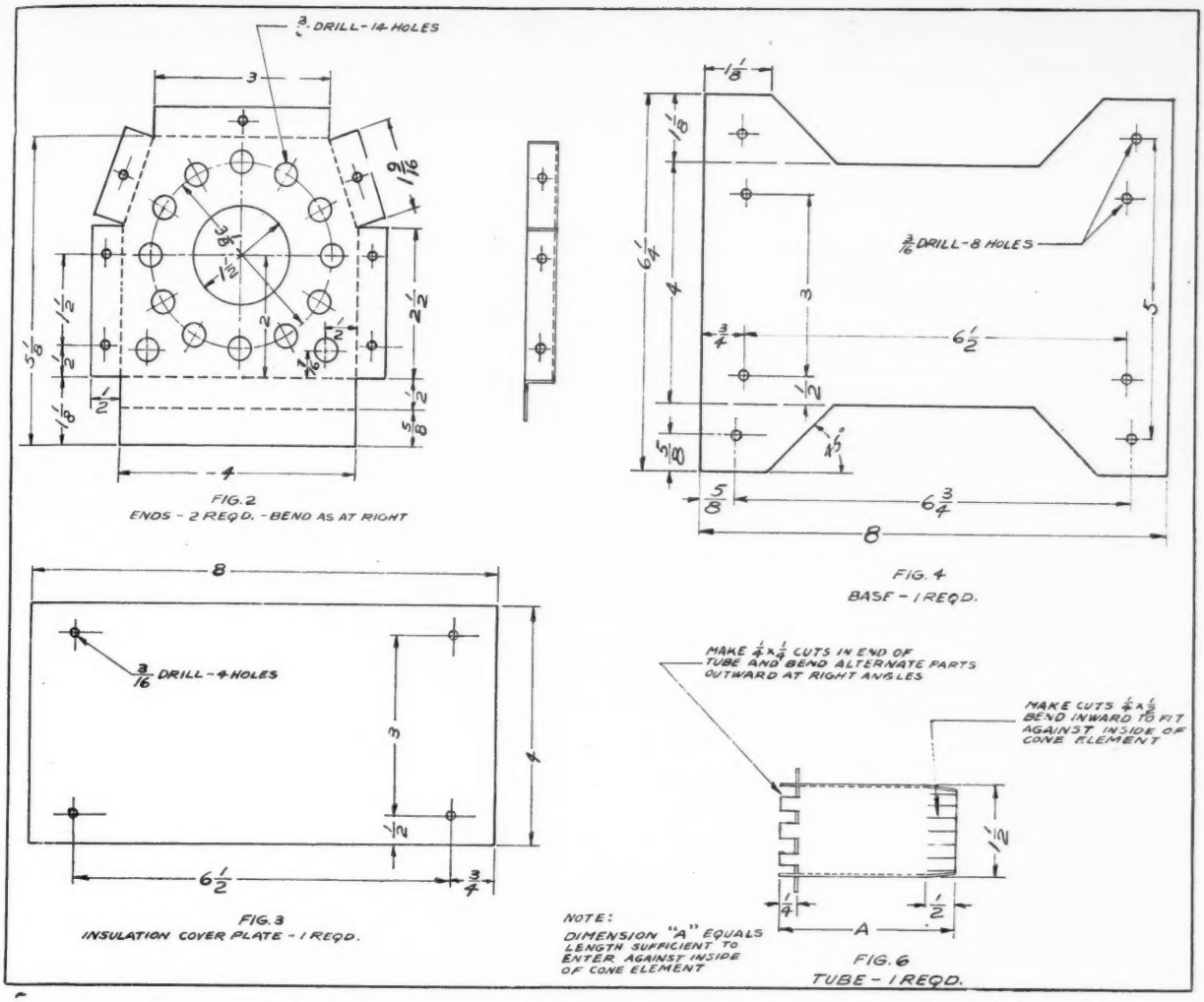

CASE- DETAIL FIG.5
2-6-32 FH SCREWS
END - DETAIL FIG. 2
TUBE DETAIL FIG. 6
INSULATION COVER PLATE - DETAIL FIG. 3
16-6-32 x ¼ R H SCREWS
ASBESTOS SHEET INSULATION SEE FIG 3 FOR SIZE
4-6-32 x ¾ R H SCREWS
BASE - DETAIL FIG 4
600 WATT CONE TYPE HEATER ELEMENT
PORCELAIN SCREW RING SIGN RECEPTACLE
NO. 14 HEATER CORD

FIG. 1


3/8 DRILL - 14 HOLES
FIG. 2
ENDS - 2 REQ'D. - BEND AS AT RIGHT
3/16 DRILL - 8 HOLES
FIG. 4
BASE - 1 REQ'D.
3/16 DRILL - 4 HOLES
FIG. 3
INSULATION COVER PLATE - 1 REQ'D.
MAKE 1/4 x 1/4 CUTS IN END OF TUBE AND BEND ALTERNATE PARTS OUTWARD AT RIGHT ANGLES
MAKE CUTS 1/4 x 1/2 BEND INWARD TO FIT AGAINST INSIDE OF CONE ELEMENT
NOTE:
DIMENSION "A" EQUALS LENGTH SUFFICIENT TO ENTER AGAINST INSIDE OF CONE ELEMENT
FIG. 6
TUBE - 1 REQ'D.

form. Fasten the front end of the case in position. Insert the tube through the hole with the end in which the cuts were made as far in the element as it will go. Mark around the tube flush with the front surface of the front end where the tube projects through the hole. Saw the tube to length allowing ¼" more in length than indicated by the mark. Now make ¼" x ¼" cuts in this end of the tube and bend alternate parts out as right angles as shown in detail of Fig. 6. Insert this end into the hole in the front end from the back and bend the projecting lugs outward at right angles. Pound them down flat against the surface to clamp the tube securely in position.

Cut enough pieces of asbestos paper of the size shown in Fig. 3 to make a thickness of ⅝" when clamped together. Clamp the asbestos pieces between the cover plate and base shown in Figs. 3 and 4, respectively, and drill the holes for the screws. Assemble with four 6-32 x ¾" screws and attach to case as shown in assembly view (Fig. 1). No. 6-32 x ¼" R.H. screws are used for attaching base and ends to the case, except that the two screws at the top are flat heads.

Attach No. 14 heater cord to receptacle terminals and plug.

Los Angeles Convention Report

Criticism of the Vocational Division of the U. S. Office of Education highlighted the 41st annual convention of the American Vocational Education Association in Los Angeles, December 15-18. Much comment was raised over the charges of C. L. Greiber, Director, Wisconsin State Department of Vocational Education; C. M. Miller, State Director of Vocational Education for Kansas; L. H. Dennis, Executive Secretary of the AVA; and Miss Florence Fallgatter, head of the Home Economics Department, Iowa State College, and president of the AVA that the Vocational Division reorganization plan was more expensive and less effective than the old plan under which the Division operated previous to last year. Commissioner of Education John W. Studebaker briefly answered the charges in prefacing a prepared address for the Home Economics section. R. W. Gregory, Assistant Commissioner for Vocational Education, U. S. Office of Education, did not appear on the program after the charges were made.

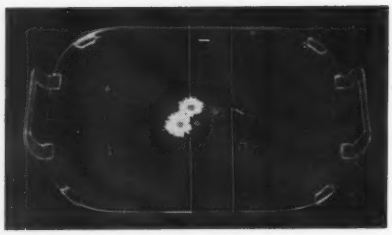
New president of the AVA is Julian A. McPhee, State Director of Vocational Education for California. Charles W. Sylvester was elected treasurer for the 21st time and the following vice-presidents were named: Industrial Arts—Frank C. Moore, Director of Industrial Arts, Cleveland, Ohio; Business and Distributive Education—Donovan R. Armstrong, State Supervisor, Distributive and Business Education, Louisiana; and Home Economics—Maude Williamson, Colorado State College, Ft. Collins.

Citations for outstanding service to vocational education were presented to Earl L. Bedell, Director of Vocational Education, Detroit, Mich., and Howard A. Campion, Assistant Superintendent of the Los Angeles, Calif., schools, by the Ship, organization of the commercial exhibitors.

The 1948 convention will be held in Milwaukee November 29 to December 4.

Executive Secretary Dennis reported a substantial increase in membership in the association. President Fallgatter announced a convention registration of 2280.

The Resolutions Committee offered a resolution which was adopted in opposition to universal military training.



Make This Plastic Tray

BY *Andrew Kovach*

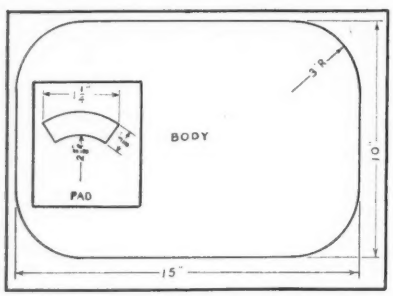
Here is a project in plastics that incorporates the interesting carving process that is becoming so popular. Andrew Kovach teaches at the Hershey, Penna., Vocational School.

TESTED INSTRUCTIONAL PROJECT

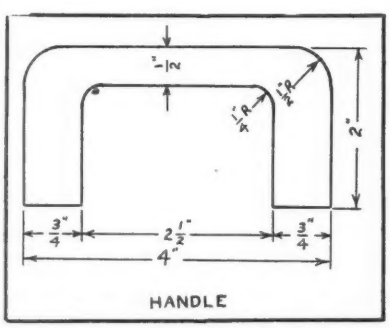
STUDENTS will find this plastic project interesting because of its simplicity in construction, its attractiveness, and its usefulness. Many operations can be taught in its construction such as laying out, sawing, filing, sanding, buffing, forming, cementing, carving, and polishing.

The first operation is to lay out and form the body. The material remaining from the corners can be used for the pads. These pads are cemented to the body at the center of the rounded corners.

In shaping the handles, first scribe a light line ½" from the ends that are cemented to the body. This will serve as



a guide for positioning the handles before they are formed. Soften the handles by heating over an open flame or in an oven at 225° fahrenheit. Line up the scribed line from the bottom side of the body to the edge of the body. Now use a small flat piece of sheetmetal and raise the handle to an angle of 45°. When cooled and hardened, the handle will retain the desired shape. The handles are cemented to the ends of the body and are placed exactly 3" from the edges of the body.



Beautiful designs can be produced by hand carving in reverse from the underside of the tray. The technic involved is extremely simple but requires practice to produce good results. The design can be taped directly to the top of the tray and should remain in that position until the carving is completed. Any good high-speed, electric hand tool with small drilling tools can be used. By the use of dyes the entire cavity may be colored or a medicine dropper can be used to place the various colors where desired. Shallow cavities may be left empty but deep cavities show up better if filled. Filling serves to bring out the outlines of the design more clearly. Plaster of Paris can be used to fill the cavity while it is still full of liquid dye.

Dyes are obtainable from The Ciba Company, 627 Greenwich Street, New York, N. Y.

Bill of Materials

1 piece of Plexiglas or Lucite—3/16" x 10" x 15"
2 pieces of Plexiglas or Lucite—3/16" x 2" x 4"
4 pieces of Plexiglas or Lucite—3/16" x 1" x 1½"
Cement
Masking Tape
Dyes
Buffing Compound
Paste Wax

Suggested Procedure

1. Square one piece of 3/16" Plexiglas or Lucite to 10" x 15" for the body.
2. Layout 3" radii at all corners.
3. Remove waste with coping saw, jig saw, or fine-tooth bandsaw.
4. Finish to layout lines with an 8" or 10" single-cut file of medium coarseness.
5. Sand with 320-grit wet-or-dry sandpaper until all file marks have been removed. (Use plenty of water during sanding to speed up the operation.)
6. Finish sanding with 400-grit wet-or-dry sandpaper to remove all scars from the coarser grade of paper.
7. Buff the edges to a high finish with firm cloth wheel, tallow, and tripoli compound.
8. Finish buffing operation on a clean, loose, cloth wheel.
9. Square two pieces of 3/16" plastic to 2" x 4" for the handles.
10. Lay out handles as per drawing.
11. Saw, file, sand, and buff to completion as was done with the body.
12. Lay out four pieces of 3/16" plastic for the pads as per drawing.
13. Saw, file, sand, and buff to completion.
14. Cement pads in place and position as per descriptive information.
15. Form handle to an angle of 45° as per description.
16. Locate position of handles and mark position with masking tape.
17. Cement handles to body.
18. Remove all protective tape surrounding cemented joints after the joints are thoroughly hardened.
19. Carve design on body if desired.
20. Paint or dye the design.
21. Fill cavity of design.
22. Remove the adhesive remaining from the masking tape with kerosene.
23. Wash entire job with exception of the carved cavity with mild soap and water.
24. Apply a coat of paste wax to all surfaces.
25. Polish to a high lustre with clean, soft cloth or clean, loose, buffing wheel.

Vocational Education

- - - - *from page* 8

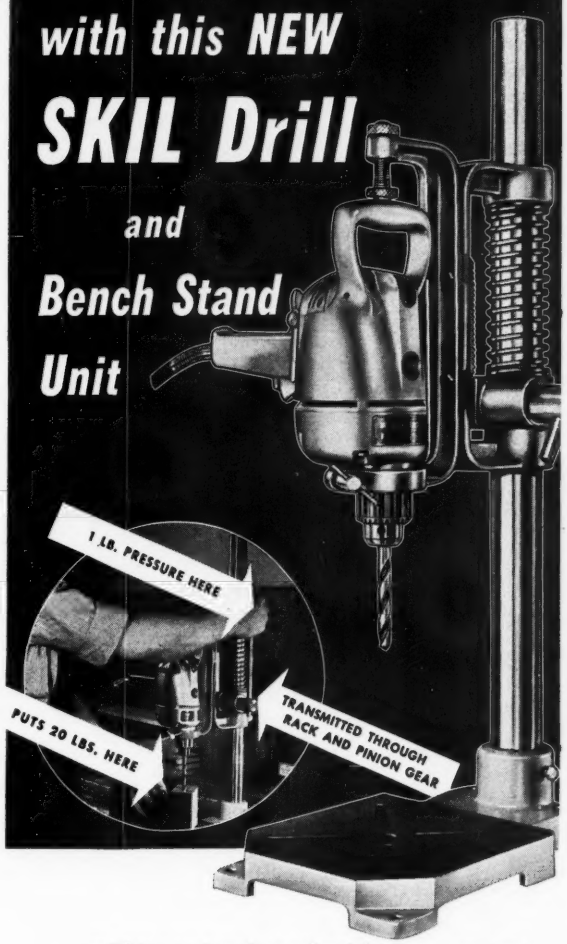
ceived us graciously and listened intently. He asked many constructive questions obviously for the purpose of getting the information he needed. As a result of our conference, we have a high regard for Mr. Ewing's intelligence and integrity but we were disappointed when our Executive Secretary, Doctor Dennis, received a letter from him recently in which he asked that we give the new plan further trial. We are unwilling to give it further trial because of what we have seen happen to vocational education in the 17 months it has been in effect.

We do not believe Mr. Ewing will resent our continued efforts to correct what is to us a very great wrong.

It is my opinion that the Commissioner and his assistant, the Director of the Division of Vocational Education, have entirely lost the confidence of the vocational people of this country. We cannot go forward constructively unless they can recapture that confidence and bring order out of the chaos that exists. They are entirely out of sympathy with what we in the states think is good administration in vocational education.

I do not know whether there is a man or woman among you who will go along with me, but because this situation is so intolerable I'm calling on you to join with your American Vocational Association in seeking Congressional approval of some administrative arrangements for vocational education which will function in all the states, as well as in Washington, and which will make it possible for us to serve the boys and girls and men and women for whom the vocational acts were intended.

Teach Precision Drilling with this NEW SKIL Drill and Bench Stand Unit



● This new bench stand quickly converts *any* portable electric SKIL Drill into a stationary drill press for precision drilling or hole saw work. Even with the standard short arm, the press delivers a 20 to 1 leverage ratio at the twist drill tip. A longer arm gives still higher pressure ratios. And, of course, the SKIL Drill can be removed in seconds for use anywhere in the shop. Call your SKIL Tool Distributor today for a demonstration at your school.

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All About Metal Gages

BY *Ward Sager*

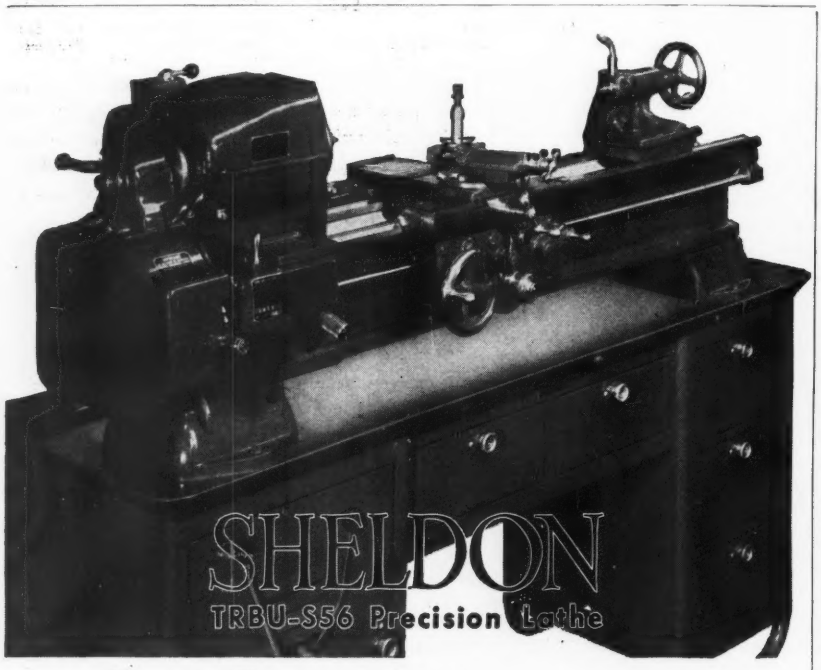
Gages for measuring metal are commonly used in the school shop, but not much is known about them. This article puts together much interesting information on gages. Ward Sager is Associate Professor of Industrial Arts at Central Michigan College of Education, Mount Pleasant.

IN the metal trades, the term "gage" is used in connection with various systems or scales for expressing the thickness or weight of plates and sheets and the diameter of rods and wires. In the early days of the metal industry, each manufacturer set up his own system of measurement and at one time there were more than 50 different gage systems in use in this country and Great Britain. These early gages had one characteristic in common, namely, the higher the gage number, the thinner the material. Chief among the early gages were the Birmingham (England) gage, one for sheets and one for wire. Peter Stubs had an iron works near Warrington, England, and he set up his own gage system. He was the first sheet and wire producer to list the equivalents of his gage numbers in decimals of an inch. In this country, the Birmingham and Stubs gages are commonly considered identical.

U. S. Standard Gage for sheet and plate iron and steel. Adopted by Congress on March 3, 1893. (All cuts courtesy Brown & Sharpe Mfg. Co.)

The United States Standard Gage for sheet and plate iron and steel was adopted by Act of Congress in 1893. This gage is based on weight per square foot in pounds avoirdupois, beginning with 20 pounds per square foot which is gage number 7/0 (0000000) and ending with 0.250 pounds per square foot (4 ounces) which is number 38 gage. This gage has been extended by custom to include number 44 gage which is 0.187 pounds per square foot or 3 ounces. This gage is also the standard for galvanized sheet iron; however, galvanized iron is 2.5 ounces heavier per square foot than uncoated iron. Iron and steel plates below number 3 gage (heavier and thicker), which is approximately ¼″ thick and weighing 10 pounds per square foot, are usually *not* designated by gage numbers, but by their actual thickness in decimal parts of one inch. Gage number 7/0 is 0.4902 or practically ½″ in thickness. One fact that may be noted in connection with the U. S. Standard Gage is that number 16 gage metal is 0.0613″ in thickness, which is practically 1/16″. Galvanized iron is furnished in the range from number 8 gage which is 0.1685″ in thickness down to number 34 gage which is 0.0084″ in thickness.

The thickness and weight of tin plate is designated by the Tin-Plate Gage which does not employ gage numbers. Instead, the weight in pounds of a standard base box is used to specify the different weights of tin-plate sheets. By the term "base box" is meant 112 sheets, 14″ x 20″, or any other number and size of sheets that will cover an area of 31,360 square inches. A popular size of sheet is 20″ x 28″. When 80-pound tin plate is specified, it means that 112



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sheets, 14″ x 20″, weigh 80 pounds. Symbols are also used in the Tin-Plate Gage system beginning with 100 pounds per base box. The symbol for 100-pound tin plate is 1CL which means, Number 1—Common—Light. The symbol for 107-pound base box is 1C; for 128-pound base box, 1XL; for the 135-pound base box, 1X; for the 139-pound base box, DC, which means—Double Common. A base box of 2X weighs 155 pounds, of 3X—175 pounds; of 4X—195 pounds, and so on up to 16X which weighs 435 pounds per base box. The range of thickness of tin plate is from 0.006″ for the 55-pound base box to 0.050″ for the 435-pound base box.

U. S. Steel Wire Gage accepted by U. S. Bureau of Standards. Also known as the Washburn and Moen or American Steel and Wire Co. Gage.

Iron and steel wire, except music wire, is measured by the United States Steel Wire Gage which is recognized as standard by the United States Bureau of Standards. The Washburn and Moen and American Steel and Wire Company gages are practically the same as the U. S. Steel Wire gage. This gage starts with number 7/0 which is 0.490 or ½″ scant and extends to number 44 which is 0.0058″ in diameter. There is a difference between the United States Steel Wire gage and the Brown and Sharpe gage used for copper and brass wire. As an example, number 14 gage steel wire is 0.080″ in diameter while number 14 gage copper and brass wire is 0.064″ in diameter. (*Continued on next page*)

American Standard (Brown & Sharpe) Wire Gage for nonferrous metals such as copper, brass, and aluminum.

The recognized standard gage for copper and brass sheets and wire is the Brown and Sharpe. The sizes included in this gage system range from number 4/0 which is 0.46″ to number 36 which is 0.005″ in thickness. Number 4/0 brass or copper plates are 7/16″ full, number 2/0 are ⅜″ scant; number 2 are 0.257 or ¼″ full; number 5 are 0.181 or 3/16″ scant, and number 8 are 0.128 or ⅛″ full. There is considerable difference in thickness of metal between the Brown and Sharpe and Stubs gages, although the range of gage numbers is identical, namely from 4/0 to 36. For instance, number 10 gage copper or brass in the Brown and Sharpe gage is 0.102″ in thickness and in the Stubs gage number 10 is 0.134″ in thickness. It may be noted that in the Brown and Sharpe gage, number 20 sheets are 1/32″ thick and number 26 are 1/64″ thick. Copper and brass wire is also measured by the Brown and Sharpe gage. However, insulated copper wire used in the electrical industry may be measured by the circular mil gage, sometimes referred to as the Edison gage. The Edison gage is identical with the Brown and Sharpe gage except that the different sizes of wire are listed by diameters in circular mils instead of decimal parts of an inch.

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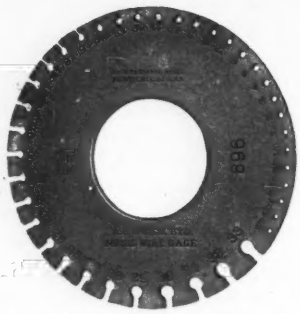


Steel Music Wire Gage for measuring steel music wire. This gage is entirely different from all the others as the small diameter wires have low gage numbers.

The music wire gage is entirely different from other gages in that the small diameter wires have low gage numbers. For instance, gage number 5/0 music wire is 0.004″ in diameter while gage number 44 is 0.170″ in diameter.

Bridging the Gulf Between Liberal and Vocational Education

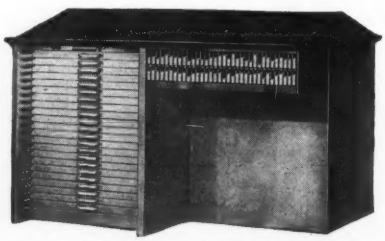
". . . The break between general and vocational education must be greatly narrowed.

"Vocational education in the narrow, specialized sense should not begin until a foundation in a socially oriented general education is assured for *all* young people. When such vocational education is begun, it should not, until the top reaches of the professional study are undertaken, be dissociated from some continuing exposure to general subjects keyed to the maturing intellectual interests.

"Teachers, both general and vocational, must see their tasks as more nearly identical than is now typically the case. The teacher of liberal arts needs to know the contemporary world better. And the teacher of vocational subjects has to be culturally more richly grounded.

"The unified and over-all objective of educating whole persons has to be restored to centrality, both in the training of teachers and in the shaping of educational policy by those responsible for curriculum building.

"We will get good workers for our kind of society only when we qualify all our youth to enter that society as persons and citizens no less than as prospective job-holders."—*Ordway Tead*, editor of social and economic books, Harper and Brothers; chairman of the Board of Higher Education of New York City; and editor of several works in the field of industrial relations.



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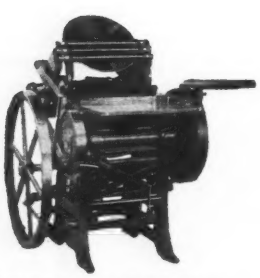

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Prospecting for Gold —1948 Style

GONE is the picture in the public mind of the old prospector with his burro and pack trudging across the western desert now that the Nevada State Board for Vocational Education is offering courses in prospecting. Lady Luck and the long-lost map with its key to rich deposits are no longer the stock in trade of present-day prospectors.

Instead they go to night school under the state's trade and industrial set-up and learn scientifically how to judge promising localities where ore deposits are likely to be found.

Other topics covered are prospecting laws, location of claims, economics of mining, marketing of various mineral products, and smelter settlement schedules. Laboratory work is offered, using blowpipe methods, in the identification of various ores and minerals. Special specimen tables are used in this work.

A Student Rating Scale

BY *Clifford K. Lush*

Teachers of advanced woodworking and other courses where one or two large projects make up the semester's work will find help here in rating student work for marks. Clifford K. Lush is Director of Vocational Education and Industrial Arts, Minneapolis, Minn.

IN advanced woodworking classes, students often have time to finish but one or two large projects during a term. The major portion of a student's mark may need to be determined from his construction of but a single project. It is often difficult to decide on a justifiable mark which meets the approval of the student, the teacher's conscience, and the school standard of mark distribution.

The use of a rating scale is one technic for marking such projects. The time of the instructor is too limited for the use of a long and involved rating chart. The one shown here is simplified but includes the essentials. The construction of the scales is based on the common practice of considering 75 as passing, 85 average, and 100 the best score.

Rating Scale For Performance In Woodworking

Name_____ Class_____ Hour_____

Project_____ Score_____

Workmanship						
Processes						AVERAGE
Tool Operation	0	5	10	15	20	25
Squareness	0	5	10	15	20	25
Dimensions	0	5	10	15	20	25
Woodfinish						
Surface Preparation	0			5		10
Finish Application	0		5		10	15
Interest	0	25	50 AVERAGE		75	100

Minneapolis Public Schools
Industrial Arts Department

Recommended for use in rating larger projects in Advanced Woodworking

The scale is used in this manner: When a boy has completed his project, he fills out the top section of the scale. The teacher, the boy, and the project then "go into a huddle." The project is on trial with the instructor as judge, and the boy as attorney for the defense. Under "tool operations" the project is scrutinized for unnecessary tool marks, etc., and after recalling the observations made during the construction period, a decision is made on a fair rating. The instructor considers 21 an average score, zero as the poorest work he has ever seen executed by a boy of that age (under similar conditions), and 25 the best.

Speed is not considered on this scale. Amount of work done during the semester will be judged by the instructor, and represented in the final mark. This is also true of interest and application of the student. Each unit of the scale is checked. A total score is then determined which becomes one of the major factors in the final mark in the course.

Woodfinishing is rated separately because it involves different abilities and represents a different group of life occupations. Many projects have been made excellently in the woodshop and ruined in the finishing room. A critical score of 25 is thus allocated this item.

The scale may be used as a guide to determine the marks of those students who have partially completed projects at a marking period occurring during the term.

The mark on a given project may not be identical to the final grade earned by a pupil; in fact it should be usually of less value than the final grade. Skill should increase with practice. Operations performed early in the construction may be inferior to those executed later, thus the ability rating of a student at the termination of a course is a more valid measure than the average of the performance ratings made during a course.

The line to rate *interest* is included to control student attitude. The score is irrelevant to the ability rating except

(*Continued on page* 20)

BOICE-CRANE
NO. 1420 SIX-INCH JOINTER

Tables on the Boice-Crane are 5" longer than most others, for the accurate jointing of 25% to 50% longer stock, and the fence is 33" long (10" longer than most others). The ONLY fence that is 100% rigid, permits steady guiding and accurate cuts through the full length of even heavy 12-foot doors and sash. Unskilled operators get perfect results and more output because they can give entire attention to feeding the stock.

The only 6-inch jointer with quick acting fence locks at *both* ends. Even six times ordinary feed pressure cannot spring fence sidewise nor up on right angle or bevel cuts.

The 2¾" diameter cutterhead has a 3" diameter cutting arc, the largest in any low-priced 6-inch jointer, for freer cutting "rake-angle" to knives, for a chatterless and much smoother shearing cut rather than the chipping and chattering cut common to smaller diameter cutterheads. Cutterhead and bearings will withstand speeds up to 5500 r.p.m.

Features a double-pivoted cutterhead guard, which when rabbeting, is not bodily removed from the machine (usually the case) but swings down and out of the way, remaining immediately replacable when conventional jointing is resumed, thus reducing the chances of failing to return guard to position.

Dual fence controls BOTH at operators fingertips.

Floor cabinet has motor compartment and dust chute.

4 models, belt or direct motor drive, bench or floor type.

SPECIFICATIONS:

Overall length: 43½".
Tables: 5" wide x 36" long.
Fence: 33" long x 3⅛" high.
Max. width of cut: 6".
Depth of cut, max.: 9/16".
Cutterhead: 2¾" dia. 3 knives.

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School Shop KINKS

Payment will be made for each "Kink" published. Send to the Editor, School Shop, Ann Arbor, Mich.

Bench Top

Those who are resurfacing old benches or making new ones may find the following technic of use. I have found it successful in building new benches for my shop.

The tops are made up of two layers of matched boards screwed to the frame at right angles. Over this is placed a sheet of ¼" tempered Masonite. Around the edge of the bench is placed a hardwood facing strip which is screwed on. This strip prevents chipping the edge of the Masonite and may be replaced easily after it is damaged by use. As a final step, the Masonite is given two coats of hot floor wax. The wax keeps the surface from becoming spotted with glue, paint, or stain and also makes it easier to keep clean.—*Wallace K. Hart, Dixfield, Maine, High School.*

No Window Peepers Now

Every teacher knows what an annoyance it is to be continually reprimanding pupils for gazing out of the windows, especially where the windows of his shop face the street or the playground.

As a simple means of effectively eliminating this nuisance, I secured six inexpensive window shades for the offending windows. These were attached to the *bottom* of the sash. At the top of the lower sash, screw eyes were installed through which the shade cord was drawn and then allowed to hang down.

When outside distractions become too bothersome, all that is necessary is to pull down on the cord, thus drawing the shade up for a distance of 10" or 12" which effectively blocks the distracting views or viewing.

This arrangement still permits the sash to be raised for ventilation without unduly darkening the room.—*Harry J. Miller, Gillespie High School, Danboro, Penna.*

Thumbtack Lifter

Removing thumbtacks from drawing boards and bulletin boards is a fingernail-breaking business. The temptation is to use a chisel or other sharp-edged tool around the shop which is bad for the tool as it is often dulled in the process.

An old plane iron cap can easily be made into a thumbtack lifter. The cap of a Stanley-type plane has a beveled front edge and the section following is slightly curved. If the beveled edge is sharpened it will easily slide under the head of a thumbtack and the curved section acts as a fulcrum for prying. The cap will retain its edge as it is made of good steel and can be resharpened when it finally becomes dull.—*C. R. Schlegel, Arlington Junior High School, Jenkintown, Penna.*

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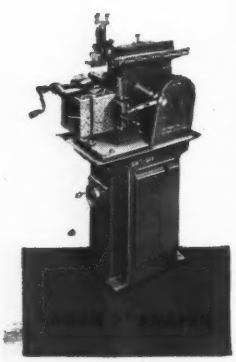

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Rating Scale--------*from page 19*

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NEWS

What's Doing in the Field of INDUSTRIAL EDUCATION

Brazilians at Colorado A & M

A GROUP of 40 instructors from trade schools in Brazil will study for the next three months at Colorado A & M College, according to Herb Heilig, Director of Vocational Education, who will supervise the program. The Brazilians are in the U. S. a total of nine months. The first three months were spent visiting vocational schools in Massachusetts and Connecticut and the next three were spent visiting various industries. The final period will be spent at the Colorado institution for technical instruction before returning home. The program is under the supervision of the Institute of Inter-American Affairs, an activity of the U. S. State Department.

Illinois Convention

THE Illinois Vocational Association will meet April 1-3 with headquarters at the Morrison Hotel in Chicago.

Mississippi Valley Conference

THE 34th meeting of the Industrial Arts Conference of the Mississippi Valley was held in Chicago on November 13-15 with 32 members present from 15 states. Topics discussed included the following: review of selected research studies in industrial arts and industrial education: needs, opportunities, and problems in industrial arts; state supervision of industrial arts; some lessons for industrial arts from the experiences of the war years; and some problems of graduate study in industrial arts. New members are William C. Bicknell, Head, Industrial Arts, Southern Illinois University, Carbondale; Nelson A. Hauer, Head, Industrial Arts, Louisiana State University, Baton Rouge; Asbury Smith, Head, Industrial Arts, State Teachers College, Edmond, Okla.; and Fred J. Strickler, Dean, Industrial Arts, Bradley University, Peoria, Ill. G. A. Frecker, St. Johns, Newfoundland, was elected an associate member.

Oswego Alumni Note

A LIST of all alumni of Oswego, N.Y., State Teachers College is being compiled so that a quarterly news letter can be sent them. If you are an alumnus who is not on the list, send your name to the Industrial Arts Department at Oswego.

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Purchase Plan . . . *from page 24*

the vocational director of the school. When tools are delivered to the school, the money is available immediately to pay for the tools on delivery.

Many values to the school, student, and tool jobber have been derived from this development of a student tool-purchasing plan. Students have developed a keener interest in tools and in the trade in which they are training.

The program has also developed a much closer relationship between tool sales houses and the school. The salesmen get into the school and see exactly what type training is being done. At the close of the past school term, these men were eager to assist the school in the placement of auto-body repair students through their contact with many auto-body shops in their area.

To the tool jobber, this program means that students will show a strong preference, in business, for the tools and equipment he learned to use in school. Second, students will learn to know various lines of tools and services offered and will have confidence and a strong inclination to deal with the same individual when he goes into industry.

This program has worked so well in the auto-body repair shop that the program will be expanded to the other trade programs of the school.

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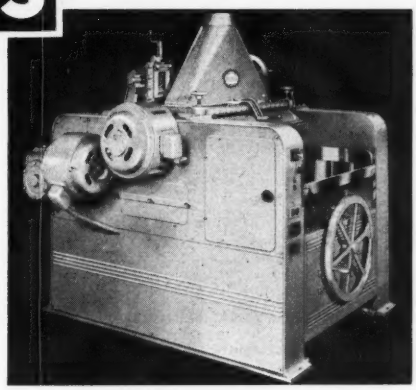

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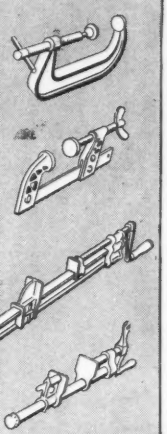

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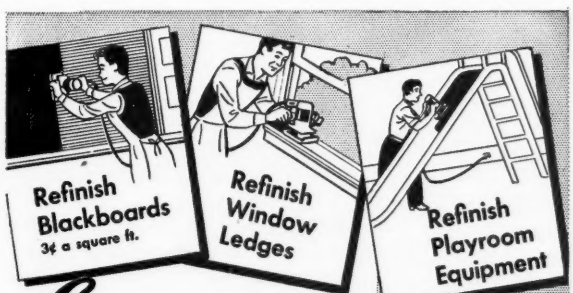

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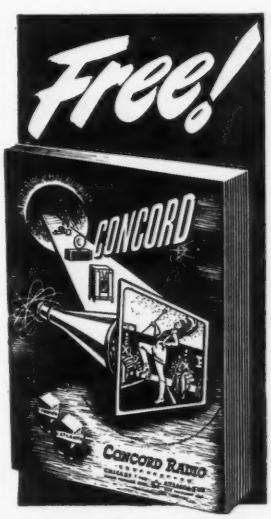

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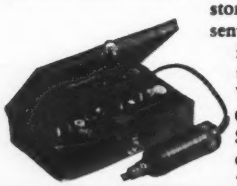

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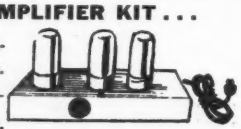

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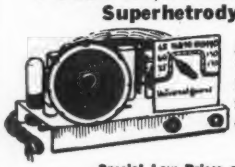

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Students in auto-body repair class getting information about tools of their trade from R. N. Wise of the Harrisburg, Pa., Auto Parts Co. Some of them have already begun to buy tools so that they will have a set when they enter industry.

Shop Student Tool Purchasing Plan

BY *Edward Jerore*

Here is a program that gets the vocational student off on the right foot in his trade and helps him to meet an important problem facing the beginning artisan—that of having the proper tools for his craft. Edward Jerore teaches auto-body repair at the Hershey, Pa., Vocational School.

THE objective of any vocational training program is to teach operations and processes which are used by tradesmen in industry. Almost all training programs cover such courses as auto mechanics, auto-body repair, farm mechanics, machine shop, welding, carpentry, sheetmetal, plumbing, etc. Vocational schools have been heavy buyers of shop equipment and it appears that this volume of business will increase since many programs are now being planned for expansion to handle the increased needs for vocational training of youth of high-school age as well as the returning veteran.

Aside from its big attraction as a source of orders, the vocational school means a great deal more to the salesman than does a commercial account of equal buying power. In addition, a virgin supply of sales customers lie in the shop students themselves, rather than the respective school shops.

It became apparent that students in auto-body repair were being graduated and were ready to take a job in industry but had no tools to begin the job. As a result, the student had to invest forty or fifty dollars for the purchase of tools or, if this amount of money was not available at the time, the boy usually secured a job in some other field of work where no tools were required.

When a boy leaves school at graduation with a set of tools which he can call his own, he is fully prepared to take a job in industry. He is more likely to leave school with pride in the trade of his choice and with a determination to get a good start in the industrial world.

This problem of tools has been recognized in the Hershey Vocational School and, as a result, a tool purchasing plan for students was inaugurated in the auto-body repair shop.

Several local automotive tool jobbers were invited to the school shop to display tools of the trade to the students. The salesman supplied the school shop with catalogs, literature, and price lists and spent considerable time in discussing tools and equipment with the class. The students took exceptional interest in the project and began placing orders and purchasing tool boxes and small hand tools. Jobbers too were quick to note the interest and the possibilities in the plan. As a result, generous discounts on purchases were allowed so that students could secure tools at approximately 50 percent of list price. This is of particular advantage to the student who is just getting started in his trade. The jobbers then assembled various sets of tools to meet the price levels of the individual students.

As the plan developed, students deposited their money periodically with

(*Continued on page* 22)

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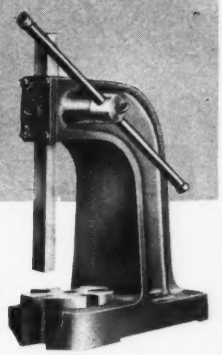

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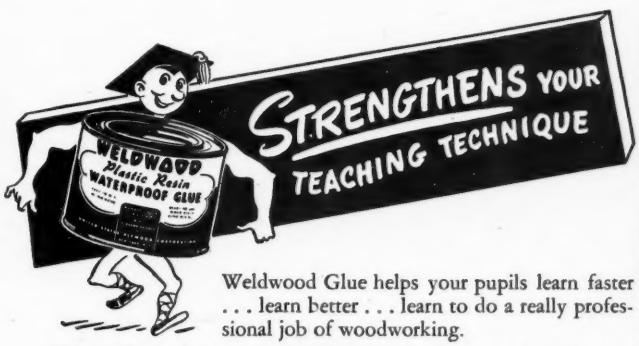

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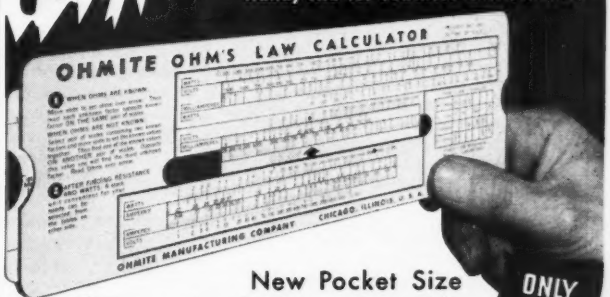

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Instructional RESOURCES

Basic Mathematics for Technical Courses. Tuites. New York: Prentice-Hall, Inc., 1946. Pp. xiv+541. $5.00.

Written primarily for use in technical institutes and junior colleges, this mathematics text is also useful for classes in industrial and extension schools as well as home study. The volume includes a chapter on the slide rule and sections dealing with arithmetic, algebra, and trigonometry. Application of principles is made in the problems which are concerned with technical matters with which the students will have to deal in other courses. Trigonometry and logarithm tables are included in the appendix.

Clarence E. Tuites teaches electricity and mathematics at the Rochester, N. Y., Institute of Technology.

Visual Aids Workbook in Printing. Campbell. Mount Pleasant, Michigan: Irwin M. Campbell, 1947. Pp. 106. $1.50. Paper bound.

Designed to be used in conjunction with a textbook, this workbook has many teachable features. It is divided into four parts: composition, press room, bindery, and paper stocks. Exercises accompany each section and consist of identifying and describing the various tools and equipment of the printer as shown in illustrations. Space is provided for students to fill in brief biographical data of men who have contributed to the graphic arts. Check tests and a bibliography are given at the end of each section. Samples of many paper stocks are bound in the section on paper. Teachers of the graphic arts will find this workbook a unique and useful tool in the teaching process.

Irwin M. Campbell teaches printing at the Central Michigan College, Mount Pleasant.

Concise Chemical and Technical Dictionary. Bennett, Editor. Brooklyn, N. Y.: Chemical Publishing Co., Inc., 1947. Pp. xxxix+1055. $10.00.

Teachers wishing a classroom reference work covering definitions in the fields of metallurgy, manufacturing, plastics, trade-name products, mathematics, electricity, mechanics, and engineering will find this a useful work. Over 50,000 definitions are included.

Surveying Instruments: Their History and Classroom Use. Kiely. New York: Bureau of Publications, Teachers College, Columbia University, 1947. Pp. 411. $3.00.

This volume has been issued as the nineteenth in the series of yearbooks of the National Council of Teachers of Mathematics. It is an exhaustive study of surveying instruments with particular emphasis on material which should be the common knowledge of teachers of mathematics in the schools. Much space is given to the historical development of surveying instruments. The development of practical geometry in the schools and the applications of geometry and trigonometry in simple surveying are covered at some length.

Teaching Aeronautics in High Schools. Haefner and others. New York: McGraw-Hill Book Co., Inc., 1947. Pp. 419. $3.50.

Subtitled "A Study of Methods, Principle, and Measurements" this volume was prepared for the Civil Aeronautics Administration and the American Council on Education by a committee under the direction of Ralph Haefner, Educational Consultant of the CAA. Concerned with teaching methods in high-school aviation education programs, the book is divided into four parts: Aeronautics Curriculums, Aeronautics Teaching, School Adjustments to Aeronautics Teaching, and Needed Research in High-School Aeronautics. The help of 17 master teachers of the subject was obtained in preparing the text. Those interested in the problems of "what" and "how" in the teaching of aeronautics will find much valuable material here.

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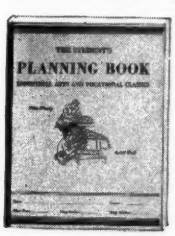

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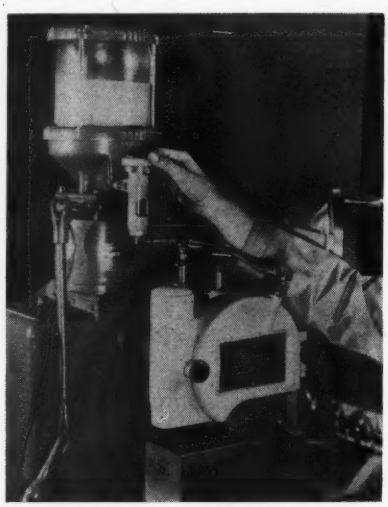

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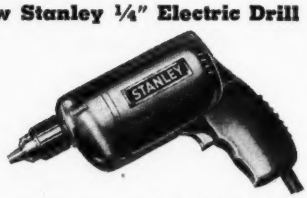

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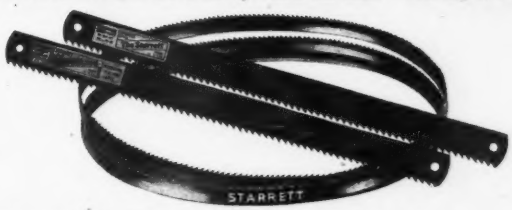

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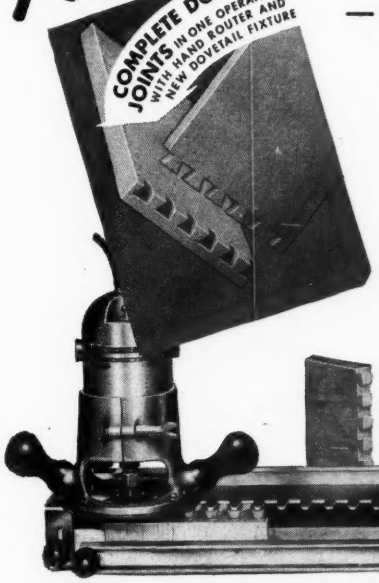

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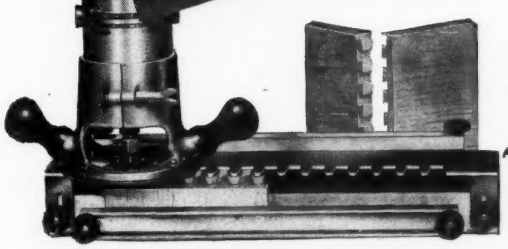

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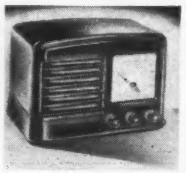

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From Washington *from page 32*

Herbert Hoover committee which is studying duplication and waste in the federal government.

The reorganization of the Vocational Education Division, whether good or bad, then, was an honest effort to simplify and make more efficient administrative service to the states. If this attempt were not made by the Division itself, it would have been subject to charges by Congress and by the White House that the Division is using outmoded operating methods.

Next I began to look for facts which would throw some additional light on why there is less travel into the states by federal agents. I discovered:

First fact: Travel by federal agents into the field is no longer the easy unrestricted activity it was 20, 15, or even five years ago. The bald fact is that today more than ever before Congress is close-fisted with travel funds. The favorite target of many economy-minded Congressmen is the travel expense accounts of any federal agency. When the present leadership took over Congress last year they sought to reduce federal expenses by cutting down on travel funds, telephone, and telegraph expenses.

Second fact: The Congressional pinch was especially painful to the Vocational Education Division. Whereas, in 1946, the Division had $42,200 with which to pay for travel expenses of its agents into the field, in 1947 the Division got only $32,500. This 23 percent cut in travel funds was necessary because the Federal Security Agency had reduced the funds for the entire Office of Education by that same percentage. Incidentally, I found that while the Vocational Education Division's travel funds were cut 23 percent, other divisions of the Office of Education suffered a much more severe slash.

Third fact: In these days of near inflation, it costs on the average $15 for an agent to spend a day in the field. At such a cost, how many days of travel will $32,500 pay for? Only about 2,150 days, which must be divided among the 50 states and territories and among the half hundred professional men and women in the Division during the entire year. In other words, with the money available, each state could count on field visitation amounting to only a little over 40 days for the entire year. These figures merely point up the inadequacy of the available travel funds. Actually the funds are not sliced as neatly as the above illustration would indicate. Some agents have to spend more time in the field, some less. But whichever way the travel funds are apportioned there just isn't as much money as there used to be.

Fourth fact: During the five war years the Vocational Education Division was assigned large portions of war and defense funds to be used for travel. These funds are no more. This is a discomforting fact, still hard to get used to, both for the Washington specialists and state and local officials.

Fifth fact: In its 1949 budget request, the Office of Education is asking for a substantial increase for travel. Whether that will be granted depends on Congressional action.

As your Washington ears and eyes, boss, my job is to dig out facts. I know that with all the facts before them local and state officials will be able to form their own judgments of the problems faced by their Washington civil-servants.

M. P.

Newkirk to USOE

Louis V. Newkirk

After several months of searching, Commissioner of Education Studebaker finally found the right man to take over the long-vacant job of federal industrial-arts specialist. The appointee is 47-year-old Louis V. Newkirk, who for the last 12 years has been director of the bureau of industrial arts for the Chicago Board of Education.

Mr. Newkirk is not yet at his desk. He was scheduled to report to work on February 2. His new boss will be Galen Jones, Director of the Secondary-Education Division.

Mr. Newkirk was born in Montezuma, Iowa. He obtained his three degrees from the University of Iowa. From 1931 to 1935 he was professor of industrial arts at the University of Chicago. Three years after moving over to the Chicago public school job (1938) he was elected president of the Illinois Vocational Education Association. In 1941 he was honored by the American Industrial Arts Association, which named him its president.

When Mr. Newkirk arrives in Washington he will find a warm welcome and a promise of cooperation from the American Vocational Association. When informed of Mr. Newkirk's appointment Secretary of the AVA Dennis said: "We know of Mr. Newkirk's good work in Chicago. We wish him, as a member of the Office of Education, a successful federal career of leadership in industrial arts."

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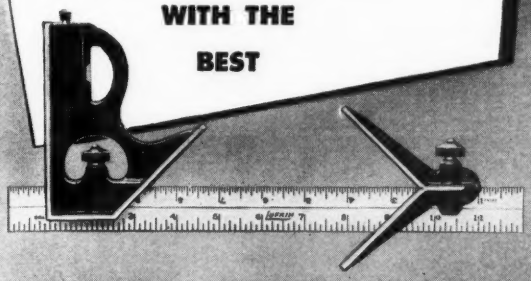

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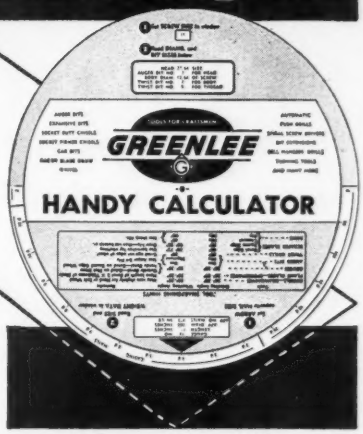

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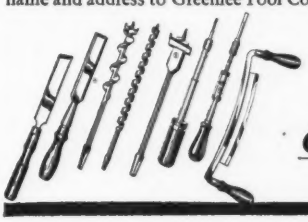

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FROM WASHINGTON

BY MICHAEL PACA

Dear Boss:

Washington was somewhat deserted while the AVA convention was going on in Los Angeles. Sorry I wasn't there myself. Sketchy newspaper dispatches from Los Angeles reported that a gentleman from Kansas said some harsh things about the Vocational Education Division of the Office of Education. That office is on my newsbeat, you know. I understand the speech was vigorously applauded by many delegates; and I also understand that afterward one prominent state leader called it "the most unprofessional speech ever heard at a professional convention."

In view of the dust this speech is kicking up in Washington and elsewhere, I'm asking the gentleman from Kansas to send me a copy for my own upbringing. The very brief newspaper stories, however, did suggest to me that I ought to recheck on several phases of the inside of the Vocational Education Division.

Even before some of the federal vocational education officials came back from the West Coast, therefore, I searched for answers to these questions:

What were some of the reasons behind the reorganization of the Vocational Education Division? Was it someone's bureaucratic idea? Was it carried out merely because a new assistant commissioner for vocational education (Ray Gregory) came into office and he wanted to have a new organization chart?

One of the surprising facts I discovered was that even while the venerable Dr. Wright was still Assistant Commissioner for Vocational Education, plans were afoot for overhauling the Division along the very lines finally carried out by Dr. Gregory.

I also learned that the reorganization plan was under discussion for nearly two years and that in these discussions many state officials for vocational education took a part.

There were compelling reasons why a change in the machinery of the Division had to take place:

1. Prior to the reorganization, 16 regional agents were responsible for administrative duties in the states—in fact, four different agents were dealing with these matters in each state. Overlapping and duplication of duties were inevitable.

2. Although the agents were primarily specialists in subject matter, they nevertheless had to carry on a host of routine management duties which included even auditing of funds.

3. Each agent was naturally concerned with his own special field (agricultural, home economics, T and I, or distributive education). There was no regional agent, therefore, concerned with problems which cut across the subject-matter fields. Such over-all aspects of vocational education as teacher training, research, dollar-for-dollar matching provisions, and general policies for using funds for the benefit of all the youth in the states were frequently lost sight of. They became "no-man's" problems.

Good business organization called for a scheme which would (1) relieve the regional agents of as many administrative chores as possible; (2) make someone responsible for over-all policies and problems; and (3) give Dr. Gregory a more simplified means for keeping in close touch with the states.

Out of the very specialists who had been regional agents, Dr. Gregory, therefore, selected four men and named them his administrative assistants. Each of these four men was assigned to cover 12 states with which to work on over-all problems and help carry on administrative chores.

Relieved of administrative duties, the technical specialists can now concentrate on the program aspects of vocational education. The four administrative assistants, in turn, can keep Dr. Gregory in close touch with the wishes and desires of state vocational workers. The efficiency experts in government (I have in mind now those outside the Office of Education) seem to think this is good, businesslike management.

While talking to some of these management experts, most of whom are to be found in the U. S. Bureau of the Budget, I also stumbled upon another reason the Division had to be reshaped as it was.

Being part of the vast machinery of government, the Division is subject to trends, forces, and pressures that affect the entire Executive Branch. This is true of all agencies of government. Now, among the current Washington shibboleths are: "Modernize federal bureaus, eliminate duplication, cut waste, use scientific methods of management!"

Pressure for more efficiency in government bureaus comes from (1) management experts in the Bureau of the Budget, (2) U. S. Civil Service Commission, (3) such Congressional groups as the Byrd Committee on Government expenditures and, most recently, (4) the

(*Continued on page* 30)

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